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ABSTRACT

This article deals with several techniques for regulating cash inflow and outflow and investing surplus cash for short periods of time. The techniques are: (1) consolidating checking accounts, (2) determining surplus cash by examining bank balances in conjunction with the cash book, (3) selecting a minimum bank balance, (4) investing a greater percentage of surplus cash in short-term investment offering a higher yield than treasury bills, and (5) receiving a telephone report of the checking account balance at the beginning of each business day. These techniques, whether partially or completely adopted, should be of value to any institution wishing to improve its cash management. (Author)

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"The increased investment income can be impressive."

TECHNIQUES FOR IMPROVING CASH MANAGEMENT

By Ronald G. Lykins

COLLEGES and universities being forced to curtail or even eliminate educational programs may have a source of additional revenue of which they are unaware. This potentially substantial source of income may be revealed through the systematic analysis of an institution's cash management system and the application of basic techniques for its improvement. This article will deal with several of these techniques for regulating cash inflow and outflow and investing surplus cash for short periods of time.

With the support of John F. Milar, vice president and treasurer of Ohio University, this writer undertook a systematic study of Ohio University's cash management procedures. The results of the study may be instructive to other institutions who desire to improve the management of cash. The findings of the study proved rather significant since it was discovered that Ohio University could increase its present yearly return of short-term investments by over $100,000.[1]

The techniques which made possible this increased potential investment income are: (1) consolidating checking accounts, (2) determining surplus cash by examining bank balances in conjunction with the cash book, (3) selecting a minimum bank balance, (4) investing a greater percentage of surplus cash in short-term investment offering a higher yield than Treasury bills, and (5) receiving a telephone report of the checking account balance at the beginning of each business day.[2] These techniques, whether partially or completely adopted, should be of value to any institution wishing to improve its cash management.

Consolidate Checking Accounts. Ohio University, during 1969-70 utilized thirteen major checking accounts in the current and plant funds. The average daily bank balance was $3,459,789. The highest bank balance for a single day was $8,154,526. On only one day during the year was the balance below $2,000,000. In examining these figures, we found that a large number of checking accounts often creates an unnecessarily large cash holding because of the minimum balances maintained in each account to cover checks as they are presented. In addition, personnel responsible for making the disbursements, for each account, tend to build in a safety reserve since they do not want to be caught short on cash. Thus, for every bank account an institution has, cash holding increases proportionately.

The traditional view that an institution should distribute its cash deposits among several banks is obsolete and a detriment to efficient cash management. In addition, it should be noted that separate cash accounts for each accounting fund need not be in separate bank accounts and that investment earnings from several funds can be pooled.[3]

By consolidating checking accounts, the following advantages are gained: (1) a single account is easier to control and evaluate than separate accounts; (2) a consolidated account confines the need for cash reserve to one account; and (3) a consolidated bank account permits the treasurer to more easily select and maintain desirable bank balances.

Determine Surplus Cash Available for Investment by Examining Bank Balances in Conjunction with the Cash Book. Cash book balances are not a reliable guide to determine how much surplus cash is available for investment. For example, Table 1 reveals that the daily cash book balance was $1,597,124 at Ohio University

[1] Although changes in the cash management system were not made until September, 1971, Ohio University improved its investment earnings by $153,063 during fiscal year 1971-1972.

[2] The above techniques are not exclusive. There are, of course, other techniques for improving cash management which are not included in this article.

[3] See Leonard H. Haag's article, "Pooled Fund Maximized Income from Short-Term Investments" in the October, 1971 issue of *College and University Business* for an excellent discussion on pooled funds.

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during 1969-70, and the average daily bank balance was $3,450,789. Thus, the cash book showed a balance of only one half of the amount actually available.

Table 1

Ohio University: Average Cash Book and Bank Balances, Combined Current and Plant Funds, by Month, 1969-70

Month	Average Daily Cash Book Balance	Average Daily Bank Balance	Ratio	Average Dollar Float
July	$1,209,964	$2,575,949	2.13:1	$1,365,985
August	1,190,361	3,147,584	2.64:1	1,957,223
September	1,697,427	3,150,910	1.86:1	1,453,483
October	1,583,660	3,088,947	1.95:1	1,505,287
November	2,318,485	4,050,798	1.75:1	1,723,130
December	2,402,869	4,613,713	1.92:1	2,210,844
January	1,532,890	3,642,872	2.38:1	2,109,982
February	1,383,110	3,576,585	2.59:1	2,193,475
March	2,212,886	4,007,282	1.81:1	1,794,396
April	1,354,582	3,335,751	2.46:1	1,981,169
May	1,074,043	2,946,211	2.74:1	1,872,168
June	1,190,053	3,285,696	2.76:1	2,095,643
Year	$1,597,124	$3,450,789	2.16:1	$1,853,665

At Ohio University the float (difference between the cash book and the bank balance) amounted to a daily average of $1,853,665 (Bank balance of $3,450,789 minus cash book balance of $1,597,124). Float fluctuates daily and is created by the time factor in internal processing, mailing, vendor processing, and the checks clearing the Federal Reserve System and returning to the home bank before they are deducted from the institution's bank balance.

An institution cannot fully capitalize on available surplus cash unless it compares the bank balances along with the cash book balance. If an institution makes this comparison it will probably discover much more money to invest than ever believed possible.

Select a Minimum Bank Balance to Maintain in the Consolidated Checking Account. The selection of a minimum bank balance is one of the most important steps in improving the effectiveness of a cash management program. Many institutions maintain a bank balance which the financial manager believes will fairly compensate the bank and which experience has shown to be satisfactory. Such a voluntary bank balance almost always results in larger cash balances than are necessary, and hence, potential investment income is lost.

Determining the minimum amount of cash which should be maintained is a difficult problem both for the bank and for the institution. Ideally for the institution, the bank balance should be only high enough to meet the demand for payment when checks are presented to the bank. However, commercial banks are in business for a profit and will generally request a balance high enough to adequately compensate them for checking account services. What is fair compensation for service is negotiable and ultimately must be mutually determined by an institution and its bank.

The bank may receive compensation through a per item cost, a standard fee, or depending upon the value of the checking account, they may not charge to the institution at all. However, if no compensating balances have been agreed upon, or if the bank does not receive a direct fee, the treasurer of an institution can infer that the bank earns money on the institution's demand deposits. Therefore, an analysis determining minimum bank balances is highly desirable.

The institution may decide to operate with a zero bank balance. That is, at the end of each business day, the checking account would be zero. Short-term investments, or other cash inflow, would be scheduled (to come due) for the next day's business. A zero balance would be almost impossible to maintain, but could serve as a target balance by which the treasurer would evaluate the efficiency of cash management.

One means of deciding upon a minimum bank balance is to analyze the cost-benefit of checking accounts by applying the standard cost accounting data found in the Federal Reserve *Functional Cost Analysis Studies.* Basically, this method involves four steps: (1) calculate the average daily cash balance available for the bank to invest (bank balance less Federal Reserve requirements), (2) based upon a standard investment earnings rate (e.g. 6.28 percent) determine the potential gross income to the bank, (3) based upon standard per item expenses of processing deposits (e.g. 10.46¢), checks (7.47¢), and other checking account maintenance expenses, calculate the cost of operating the checking account to the bank, (4) subtract the expenses of operating the account from the gross income to determine the net benefit of the institution's checking account to the bank.

The foregoing analysis can be very significant for a treasurer. For example, based upon cost-benefit analysis of Ohio University's checking accounts, it was revealed that during 1969-70 a single bank could have earned a net income of $170,299 on the average daily cash balance of $3,450,789. By the above cost-benefit analysis it was further determined that the average daily bank balance could have been maintained at an average of $335,009 while still being profitable to the bank based upon standard cost accounting data. Thus, in this particular situation $3,115,780 ($3,450,789 minus $335,009) of surplus cash could have been released for short-term investments.

Invest a Greater Percentage of Surplus Cash in Short Term Investments Offering a Higher Yield Than Treasury Bills. Colleges and universities which customarily invest most or all of their surplus cash in

Treasury bills are losing a sizeable potential investment income. The reason for this potential loss is that Treasury bills, since they are the safest and the most liquid of investment media, typically offer the lowest yield.

Naturally, treasurers of educational institutions want a high degree of safety and liquidity and, consequently, like to invest in Treasury bills. However, if a treasurer carefully evaluates cash needs and surveys the money market, he will probably discover that there is no need to confine his investment portfolio to Treasury bills. A treasurer desires liquidity because he wants to be prepared for unexpected cash needs and be able to quickly convert investments to cash. However, because payrolls generally compose about seventy-eighty percent of an institution's operating budget, the treasurer can invest to meet payrolls with concern for safety but little need for liquidity. For example, Certificates of Deposit, which generally offer a yield of seven-eighths percent higher than Treasury bills, are an excellent investment media for payroll needs.

In addition to Certificates of Deposit, there are many other investment media that are considered by financial authorities to be quite safe and suitable for institution portfolios and at the same time generally offer a higher yield than Treasury bills. Some of these instruments are Federal Intermediate Credit Banks (FICB's), Banks for Cooperatives (BC's), Federal Land Banks (FLB's), Federal Home Loan Banks (FHLB's), Federal National Mortgage Association (FNMA, also commonly known as Fannie Mae), and Bankers Acceptance and Commercial Paper (prime). The fact that all of the foregoing investments are acceptable collateral for a member borrowing from Federal Reserve Banks gives an indication of the appropriateness of these instruments in institutional investment portfolios.

Table 2 illustrates that investment earnings could be much improved by investing in instruments with higher yield than Treasury bills. By moving from the most conservative investment practice of Option 1 (100 percent Treasury Bills) to the more aggressive Option 3, the investment income could be increased by $22,800. Investing 100 per cent of the portfolio in prime commercial paper the investment earnings could be improved even more.

Each college or university must decide individually what type of investment practices it will follow. However, if institutions move away from Treasury Bills, the increased return can be substantial.

Receive a Telephone Report of the Checking Account at the Beginning of Each Business Day. The vast difference between the cash book and the bank balance compounds the problem of maintaining a desirable amount of cash in a bank account and of determining how much to invest or sell to meet transactional needs. The ideal situation would be to project accurately when deposits would be made and disbursement checks would be presented to the bank. Although a precise projection is impossible, one excellent means of mitigating the problem is to receive a telephone report of the checking account at the beginning of each business day. After receiving this report, the treasurer can evaluate the bank balance and determine, for example, whether investments should be sold or purchased as the case requires.

Checking the bank balance daily requires the bank's cooperation. However, most banks will gladly perform this service for good customers. If this technique is adopted, the institution will probably discover that it can maintain a zero or even a negative cash book balance while still maintaining a substantial bank balance. For example, Table 3 illustrates that Ohio University, after implementing this technique, found that during October 11 to November 7, 1971, the average cash book balance for the current funds was a negative $404,662 while the average daily bank balance was a positive $493,438.

Table 2

Simulation of Various Investment Alternatives for an Investment Portfolio of $3,000,000

Option	Percent Composition	Investment Instrument	Average Amount to Invest	Average Earnings Rate*	Investment Earnings
I	100.0	Treasury Bills	$3,000,000	4.0	$120,000
II	50.0	Treasury Bills	1,500,000	4.0	60,000
	50.0	FNMA Discount Notes	1,500,000	4.5	67,500
	100.0		3,000,000		127,500
III	10.0	Treasury Bills	300,000	4.0	12,000
	70.0	Certificate of Deposit	2,100,000	4.8	100,800
	20.0	Commercial Paper (PRIME)	600,000	5.0	30,000
	100.0		3,000,000		142,800
IV	100.0	Commercial Paper (PRIME)	3,000,000	5.0	150,000

* The approximate current equivalent bond yield in the money market for investment maturities of 270 days.

In summary, an institution of higher education which desires to generate additional income may do so through a systematic examination of its cash management system. Such an investigation should reveal opportunities for improving cash management. Once the opportunities are identified, the treasurer may choose to apply some of the techniques described in this article. If this is done, the increased investment income can be impressive, and the additional revenue offers the potential to enhance the quality of an institution's educational program.

Table 3

Ohio University
Average Daily Cash Balances
For All Current Funds
October 11 to November 7, 1971

October		Daily Bank Balance	Daily Cash Book Balance
Monday	11	$618,000	$(489,000)
Tuesday	12	503,000	(465,000)
Wednesday	13	250,511	(502,870)
Thursday	14	195,588	(506,000)
Friday	15	731,227	(192,439)
Saturday	16	731,227	(192,439)
Sunday	17	731,227	(192,439)
Monday	18	646,939	(328,513)
Tuesday	19	484,874	(436,625)
Wednesday	20	447,057	(295,332)
Thursday	21	444,057	(295,232)
Friday	22	444,807	(132,906)
Saturday	23	444,807	(132,906)
Sunday	24	444,807	(132,906)
Monday	25	334,033	(230,780)
Tuesday	26	359,548	(148,302)
Wednesday	27	309,967	(323,753)
Thursday	28	296,111	(408,845)
Friday	29	596,475	(177,457)
Saturday	30	596,475	(177,457)
Sunday	31	596,475	(177,457)
November			
Monday	1	1,258,962	(55,200)
Tuesday	2	871,022	(691,875)
Wednesday	3	688,493	(831,193)
Thursday	4	290,976	(883,201)
Friday	5	165,534	(976,806)
Saturday	6	165,534	(976,806)
Sunday	7	165,534	(976,806)
Average		493,438	(404,662)

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